169624

SOIL SAMPLING PROGRAM STUDY PLAN

ECC Site
Zionsville, Indiana

35.5L30.0
W65230.C3

May 4, 1984

GLT90/77

CONTENTS

Section 1
SAMPLING OBJECTIVES AND LOCATIONS

The general objective of the ECC soil sampling program is to acquire data that will assist the ECC project team in determining the extent of organic hazardous substances contamination present in the soils on the ECC site. Data will be acquired through a combination of field screening with an organic vapor analyzer (OVA), onsite testing with an OVA, and Contract Laboratory Program (CLP) testing. The data generated from the field screening and testing of soil samples will be used in the development of the contaminated soil removal program for the site. The CLP test data will be used as a check of the field data.

Soil boring samples will be obtained for onsite screening and contaminant testing from approximately 200 locations (shown in Figure 1) that were chosen based on a 25-foot-square grid spacing. The ECC site was also divided into several areas, each containing a specified number of boring locations. A higher number of samples will be collected in areas where wastes were known to have been spilled or mixed in shallow pits. Fewer samples will be collected in areas not suspected of containing contaminants. The borings are expected to be a maximum of 2.5 feet deep and will not be advanced below the water table. In addition to the samples obtained from the soil borings, surface soil samples will be collected at various locations around the site.

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Section 2
SAMPLING PROCEDURES

Soil borings will be advanced using chrome-moly or stainless steel hand augers. Soil samples will be collected at 1-foot maximum intervals in each boring until a depth of 2.5 feet is reached or until samples no longer register a response on the OVA (or HNU) above background levels. Each soil sample will be logged and classified by a geologist or geotechnical engineer and will be composited and stored in clean, numbered glass jars with Teflon liners under the caps. Augers and sampling rods will be washed between each sampling event using a two-rinse procedure consisting of a TSP solution and distilled water. Excess drill cuttings and all water will be drummed and stored in a secure area onsite. Boreholes will be grouted with bentonite slurry upon completion of sampling. All boring locations will be surveyed and plotted on the site topographic map.

As part of the sampling procedure, all samples will be screened offsite using headspace analysis techniques with an OVA. The screening technique enables field sampling personnel to determine the depth and approximate concentrations of volatile organics in the soil.

Other selected soil samples will be submitted to the CLP for a complete organic and inorganic scan. Soil samples tested with the OVA or sent to the CLP will be split-sampled with the responsible parties.

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Section 3
SAMPLING EQUIPMENT

The following equipment will be used for the ECC soil sampling program:

- Four chrome-moly, or stainless steel hand augers
- U.S. EPA sample containers
- Coleman sample coolers
- Five 55-gallon drums
- Decontamination equipment
- Camera and film
- Foxboro Organic Vapor Analyzer
- HNU

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Section 4
SAMPLE HANDLING AND SCREENING

All of the soil samples to be collected at the ECC site are expected to be low or medium concentration samples. The following handling procedures will be used to satisfy chain-of-custody requirements.

- The sample team will collect the soil sample, place the sample into the appropriate premarked sample containers and measure the organic vapors given off by the sample with the OVA.
- Following the sample screening, the sample will be properly closed and the exterior of the sample container will be decontaminated.
- The sample will then be transferred to the temporary storage facility onsite until final disposition is determined.

Samples placed into temporary storage are subject to the following alternative dispostions:

- Onsite OVA testing (approximately 100 samples will be analyzed)
- CLP testing (approximately 35 samples will be analyzed)
- Splitting and transfer to the responsible parties
- Proper disposal by U.S. EPA

TOTAL VOLATILE SCREENING

This procedure allows an operator to rapidly and qualitatively determine whether any volatiles are present in a large number of samples. The elements of the process are:

- VOA's containing sample material with 25 percent headspace will be warmed to 90°F. A water bath will be used to accelerate the process.
- Each sample will be shaken vigorously for about 20 seconds to drive volatiles from the sample [redacted] into the air headspace above the sample.
- The OVA will be started up and allowed to run for several minutes. The column temperature should be given time to equilibrate with the surrounding temperature.

- For sample injection, the BACKFLUSH VALVE must be in the DOWN position and the SAMPLE INJECT VALVE in the UP position. This will allow a determination of total volatile organics and methane.

- A gas-tight syringe will be flushed several times in "clean" air. A check for syringe cleanliness can be made by inserting the syringe into the injection port of the OVA and slowly depressing the syringe plunger while watching the read-out meter. Note that any injections made with the BACKFLUSH VALVE in the DOWN position will go directly to the FID without going through the column. If the read-out meter responds while the blank injection is being made, the syringe should be considered dirty and should be flushed again; a second blank injection should then be made. If the syringe is heavily contaminated, it should be cleaned.

- The gas-tight syringe will be used to withdraw vapor from the headspace of the sample. The amount of vapor withdrawn is dependent on the anticipated concentration of contaminants. For example, 1.0 ml would be a recommended starting volume for a "clean" sample, whereas 250 ul would be a starting volume for a "dirty" sample. Depending on the response of the initial injection, a second injection can be made for confirmation. Highly concentrated samples may yield a response even before the plunger is depressed, since the vapor diffuses rapidly from the syringe.

- The Strip Chart Recorder should be started up, and the vapor injected into the GC column injection port. In injecting this sample, it is not important to introduce the sample all at once, as in running a chromatogram. The sample should be introduced relatively slowly to avoid blowing out the flame in the FID. As the syringe plunger is depressed, the needle on the read-out meter and the pen (imprinter) on the Strip Chart Recorder will respond to the pressure produced by the injection. This response should not be misinterpreted as a response to the pressure of volatiles, which may take place in 1 or 2 seconds.

- If volatiles are present, a "backflush" peak will be recorded, and an upscale response of the needle on the read-out meter will be noted. If no volatiles are present, there will be no peak and no response.

- The "backflush" peak height and duration of the upscale response related to the injection size are indicative of the total volatile organic compound concentration in the sample.

- The sample number and injection size should be recorded directly on the strip chart paper.

- After each sample, the gas-tight syringe should be flushed and a blank injection made to check cleanliness.

By using the technique described above, it will be possible to quickly separate those samples not having volatiles from those containing volatiles.

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Section 5
HEALTH AND SAFETY PLAN

The following health and safety plan (H&SP) has been prepared by E&E, Inc., specifically for the soil sampling activities at the ECC site.

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ecology and environment, inc.

REM/FIT
SITE SAFETY PLAN

A. GENERAL INFORMATION

SITE: Enviro Chem Corp. CH2M HILL NO.: W 65230-C3

LOCATION: Zionsville, Indiana (U.S. Route 421)

PLAN PREPARED BY: Peter J. Gorton DATE: 4/30/84

APPROVED BY: [signature] DATE: 5/2/84

OBJECTIVE(S): Sample soils via hand auger to a depth of 2 feet at 200 locations. (Approximately 50 in old drum area, and the remainder near the concrete pad, on the berm and the off-site perimeter.) Also OVA-GC injection for total organics off soils headspace.

PROPOSED DATE OF INVESTIGATION: Week of May 7th

BACKGROUND REVIEW: Complete: ____ Preliminary: X

DOCUMENTATION/SUMMARY: Overall Hazard: Serious: ____ Moderate: X

Low: X Unknown: ____

B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): Liquid X Solid X Sludge X Gas ____

CHARACTERISTIC(S): Corrosive X Ignitable X Radioactive ____ Volatile X

Toxic X Reactive X Unknown X Other (Name) Fungi (unknowns)

FACILITY DESCRIPTION: Inactive waste storage and recycling facility for solvents and oils from various sources.

Principal Disposal Method (type and location): Waste storage in drums, tanks, pond and solidification.

Unusual Features (dike integrity, power lines, terrain, etc.): Drums and horizontal tanks have been removed recently. Vertical tanks have been emptied. The solidification area should be cleaned up by project start date. The cooling water pond has been pumped out a number of times.

Status: (active, inactive, unknown) Inactive (recent cleanup work and possible concurrent cleanup.

History: (worker or non-worker injury; complaints from public; previous agency action): Facility operated from 9/77 to 5/82. On-site cooling water pond of $1 \times 10_6$ gal. Overflowed into Eagle Creek, which is tributary to a drinking water reservoir. History of groundwater contamination with 1,1,1-TCE, 1,2 Dichloroethane, and PCBs. EPA and TAT conducted site inspection 1982. Odors noted from cooling water. CH2M Hill Ramp visit during May 1983, remedial work conducted 7/83-8/83. Cleanup contractor has recently removed drums and some tanks. Other tanks are empty.

C. HAZARD EVALUATION

Refer to Attachment A

D. SITE SAFETY WORK PLAN

PERIMETER ESTABLISHMENT: Map/Sketch Attached? Yes Site Secured? Yes

Perimeter Identified? Yes Zone(s) of Contamination Identified? *

*Soil sampling will attempt to verify zone of soil contamination.

PERSONAL PROTECTION:

Level of Protection: A ____ B ____ C X D X

Modifications: Refer to Attachment B.

Surveillance Equipment and Materials: Wind direction indicator (i.e., surveying tape) O_2/explosimeter, OVA and/or HNU with 11.7 ev and 10.2 ev lamp, TLD badges, monitox cyanide detector, mini rad-alert monitor. Dust suppression instrumentation OVA with strip chart and syringes for total organic headspace determination.

ATTACHMENT A

Hazard Evaluation

A cleanup contractor has recently removed all drums and the tank cars that existed on-site. Also the vertical storage tanks have been emptied and the cooling water pond has been pumped out multiple times. However, significant soil contamination was evident during previous visual inspections due to drum leakage, spills, and facility operations. Cleanup operations may have caused additional spillage of drum and tank contents.

Previously reported wastes known to be associated with this site include: cyanides, heavy metals, chlorinated solvents, polynuclear aromatic hydrocarbons, phenols, waste oils, unknown wastes, and other chemical miscellany. A new list of chemical contents data may have been generated during the tank and drum removal and if available, should be reviewed by the Project Manager and Site Safety Officer prior to on-site activities. A list of previously reported data is attached.

Exposure hazards exist via the inhalation, ingestion, and dermal contact from the wastes listed above.

Other potential health hazards exist due to the various fatigue factors associated with wearing protection equipment, the work being done on the site, and the work schedule.

Heat stress, fatique, cramps, or exhaustion may also become a factor of personnel safety. All personnel should be made aware of physical signs, symptoms, and treatment techniques associated with each of these conditions. Work schedules may need to be adjusted accordingly if the factors of heat stress become apparent. All personnel should be encouraged to increase their intake of water during breaks and should avoid the intake of diuretics such as coffee, tea,

colas, or other caffeinated liquids. The use of salt tablets is not encouraged. Refer to the attached heat stress monitoring method.

The entire site should be considered hazardous. Specific hazardous areas on-site include:

1. The cooling water pond and surrounding area;

2. The solidification pit;

3. Areas of pooled standing water in the vicinity of where the drums were;

4. On-site building;

5. Areas where cleanup and drum removal has taken place; and

6. The concrete pad area.

Strict contamination avoidance practices should be adhered to at all times.

Overall Hazard Potential

On-Site. Moderate respiratory and dermal hazard due to task objectives, previous site practices, and recent cleanup operations.

Off-Site. Low, however, the following areas are of greater concern:

- o Downgradient of site,
- o Drainage areas, and
- o Site egress and entry points.

These quantities are estimates based on incomplete information.

Materials processed at ECC during its recovery/reclamation/brokering operations are listed in Table 2-1. Descriptions of these materials are presented in Table 2-2.

2.3.1 Bulk Storage Tanks

The bulk storage tanks are located mainly in the northern portion of the site surrounding the process building (see Figure 2-3). Known individual bulk tank storage volumes vary from 1,000 to 30,000 gallons. Table 2-3 is a partial bulk tank inventory. Bulk tank locations are identified in Figure 2-4. Of the remaining 19 tanks, at least 5 are tanker trucks that have been parked onsite. There are reportedly two buried tanks onsite.

Available test data indicate that sampling and analysis of the bulk storage tanks has been limited to one sample of a boiler fuel tank taken on May 6, 1980 by the ISBH. The fuel was composed of the following compounds:

Octane	6.2%
Acetone	13.3%
1,1,1-trichloroethane	1.6%
Methyl Ethyl Ketone	13.7%
Trichloroethylene	1.3%
Methyl Iso-butyl Ketone	3.0%
Toluene	18.4%
P-xylene	5.6%
M-xylene	20%
O-xylene	4.4%

Analysis for heavy metals found the following:

Cadmium	less than 1 ug/l
Chromium	25 ug/l
Lead	74 ug/l
Nickel	4 ug/l
Zinc	179 ug/l

2.3.2 Fifty-five Gallon Drums

Fifty-five gallon drums are stored in the north and south drum storage areas, generally stacked three to four high (see Figure 2-3). An inventory of drums was conducted on November 25, 1981, 6 months before the site was closed. Results of the inventory are shown in Table 2-4.

Sampling and analysis of drums has not been undertaken. The majority of drums, however, are reportedly labeled and manifested according to RCRA regulations. An ECC inventory of

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Table 2-1
MATERIALS PROCESSED AT ECC

MATERIAL	PROCESS METHOD			ULTIMATE DISPOSAL		
	Distillation[a]	BTU Recovery	Fixation[b]	Distillates For Sale[c]	Incineration	Landfill
RECOVERABLE LIQUIDS						
Lacquer Thinner	X			X		
Paint Solvents	X			X		
Washup Thinner	X			X		
Chlorinated Solvents	X			X		
Ink Solvents	X			X		
Still Bottoms		X			X	
Scrap Paint		X			X	
Paint Resins and Pigments		X			X	
Scrap Glue		X			X	
Resin Additive		X			X	
Scrap Oil		X			X	
NONRECOVERABLE SOLIDS						
Paint Filters			X			X
Paint Solids			X			X
Vinyl Residues			X			X
Paint Booth Overspray Waste			X			X
Metal Hydroxide Sludges			X			X
Drum Bottoms			X			X
Settled Solids from Distillation			X			X

[a] Distillation on thin film unit.
[b] Fixation with sand, calcium, oxide, kitty liter or fly ash.
[c] Distillates sold, still botttoms disposed at secure landfill.

Source: ECC Records.

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Table 2-2 (page 1 of 2)

DESCRIPTIONS OF MATERIALS PROCESSED AT ECC

RECOVERABLE LIQUIDS

Lacquer thinner - A mixture of solvents composed of members of the ketone and acetate families used to dilute lacquers for coating surfaces.

Paint Solvent - Specific industrial solvents such as methyl ethyl ketone, toluene, xylene, etc., used in industries to thin paint, speed up or reduce drying time, etc.

Washup thinner - Mixtures of flammable solvents used to strip paint from spray guns, machine parts, etc.

Chlorinated solvents - Mixtures of nonflammable solvents such as tetrachloroethylene, methylene chloride, and trichloroethylene that are generally used for degreasing metals in industry.

Ink solvents - Mixtures of flammable solvents composed of members of the acetate and alcohol families used to remove dyes and inks in the printing industries.

Still bottoms - The remaining portion (sludge) of a material that has been processed on a distillation unit.

Scrap Paint - Outdated paint, paint that has been made incorrectly, or paint that will not meet a customer's needs.

Paint Resins & Pigments - Outdated resins and pigments used in the production of latex and enamel paints that will no longer meet quality standards.

Scrap Glue - Outdated glue, glue that has been made incorrectly or will not meet a customer's needs.

Resin additives - Plasticizers (nonvolatile compounds) and dispersion agents.

Scrap Oil - Used oils that have been contaminated with water, dirt, metal shavings, etc.

NONRECOVERABLE SOLIDS

Paint Fillers - Spent filters that have been contaminated beyond use.

Paint Solids - Solids that have settled out of old paint and will not disperse back into the paint solution.

Vinyl residues - Old vinyl resins that have hardened due to evaporation of solvents from the original mixture.

Overspray paint booth waste - A solid waste that consists of reacted, film-forming paint that has been scraped from a paint spraying process.

Metal hydroxide sludges - Sludges from the plating industry that contain metals tied to hydroxide groups.

Source: ECC Records.

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ATTACHMENT B

LEVEL OF PROTECTION

On-Site Soil Boring and Sampling

On-site work will require Level C protection with the ability to upgrade to Level B. On-site areas known or suspected to be contaminated and not being sampled should be strictly avoided (i.e., visually discolored soils and ponded water, storage tanks, and covered and open lagoons). The site shall be entered from an upwind location if possible with continuous monitoring. The potential for levels of known and unknown volatile and particulate contaminants above those previously measured are possible, especially during subsurface soil sampling. Therefore, continuous monitoring with an OVA and/or HNU, O_2/explosimeter, and other surveillance equipment is required. Dust suppression is recommended.

Level C Personnel Protection

- PVC or Saranex coated Tyvek coveralls.
- Full face (ultratwin) air purifying respirator with combination particulate/organic vapor cartridges (GMC-H).
- Neoprene or butyl rubber gloves over surgeons gloves (taped at wrist).
- Disposable booties over neoprene steel toe/shank boots.
- Hard hats.

Level B Personnel Protection

- One (1) piece saranex/sigel coated coveralls with hood.
- SCBA.
- Viton and/or butyl, or neoprene gloves over surgeons gloves.
- Disposable booties over neoprene boots.

Action levels for the required site instruments are as follows:

- OVA/HNU
  - Any readings above off-site, upwind background will require Level C protection (this refers to off-site work since on-site work will be performed in Level C protection).
  - Readings greater than 5 ppm above background will require Level B protection and may dictate revisions to work techniques.
  - Levels greater than 5 ppm dictates immediate site evacuation and reevaluation of work activities by the SPM and SSC.
- Explosive meter levels greater than 50% LEL will dictate immediate site evacuation and re-evaluation of the work plan.
- O_2 meter levels less than 19.5% or greater than 21% will dictate immediate evacuation and re-evaluation of the work plan.
- Cyanide (especially hydrogen cyanide) at the OSHA PEL levels (10 ppm) and radiation detection will warrant evacuation and re-evaluation of work plan.

Off-Site Soil Boring and Sampling

Off-site work will require a modified Level D protection initially with the ability to upgrade to Level C. Off-site areas

suspected of being contaminated should be sampled in Level C initially until a decision to downgrade to the modified Level D can be made.

A decision to downgrade to either a modified or normal Level D will be made by the site safety officer and will be based on but not limited to the following criteria:

- o Monitoring results with consideration for the limitations of the instrumentation;
- o History of task objectives area; and
- o Site conditions (i.e., windy, wet, stained soils, and odors).

Action Levels

- o Any instrumentation readings above background will require Level C protection.

Modified Level D Protection will include:

- o Tyveck disposable coveralls;
- o Neoprene gloves over surgeons gloves;
- o Disposable booties over neoprene steel toe/shank boots;
- o Hard hat with face shield; and

APR with GMC-H cartridges.

Normal Level D will include work cloths, work gloves over surgeons gloves, and steel toe/shank work boots.

Sample Headspace Analysis with OVA

Level D protection with two layers of surgeons gloves will be required. If syringe ingestion is not used an APR will be required.

Heat Stress

In the levels of protection prescribed above, heat stress can be a major hazard to personnel. All individual on-site workers will be monitored for symptoms of heat stress immediately upon leaving the decon line. Appropriate actions must be taken should symptoms arise. Heat stress monitoring and avoidance techniques include:

- o Avoid consumption of caffeine-containing liquids;
- o Have water or Gatorade on hand;
- o Shift work responsibilities so that each person has a sufficient rest period;
- o Measure heart rate and body temperature frequently (per attached heat stress monitoring memo - see Browha Method).
- o Measure weight daily to insure no critical loss of fluids;
- o Buddy System is imperative; and
- o Make sure that workers consume a sufficient amount of liquids to replenish the bodies electrolytes.

DECONTAMINATION PROCEDURES: Refer to Attachment C.

Special Equipment, Facilities, or Procedures: Refer to Attachment C.
First aid kit, eye wash unit

SITE ENTRY PROCEDURES: Enter from an upwind position if possible. Avoid all possible surface contamination when possible. Buildings are not to be entered.

Team Member	Responsibility
Dennis Totzke - CH2M Hill	Project Manager/Sampler
Ike Johnson - CH2M Hill	Sample Team Leader
Brad Berggren - CH2M Hill	Sampler/Instrument
Randy Weltzen - CH2M Hill	Surveyor/Sampler/Decon
Mark Lepkowski - CH2M Hill	Decon/Sampler/Chain of Custody
Don Woods - E & E	Site Safety/OVA Headspace
Peter Gorton - E & E	Site Safety/OVA Headspace

WORK LIMITATIONS (Time of day, etc.): Continous air monitoring is to be provided. Daylight hours only. Daily safety meetings in areas were there is a potential for buried drums (known/suspected), a thorough magnetometer survey will be conducted prior to boring.

INVESTIGATION-DERIVED MATERIAL DISPOSAL: Disposables will be properly bagged, labelled, and contained on-site for later disposal. Auger cuttings should be disposed of according to local, state, and EPA protocol. Decon water should be contained and later disposed of.

ATTACHMENT C

ON-SITE OPERATIONS

Site Organization

In order to create efficient and safe working conditions, access to and from the site must be controlled by delineating those areas considered as potentially hazardous and by associating certain areas of the site with certain work activities. For this purpose, a three-zone operation area, including an administrative support area ("clean"), a contamination reduction area (potentially "hot"), and an exclusion area ("hot"), will be established and approved by the site safety officer prior to commencement of work activities.

The administrative support area should be located if possible at a recommended distance of approximately 50 meters or more upwind from the contamination reduction area and upwind of all on-site contaminated areas. Personnel in this area will wear Level "D" personnel protection.

The contamination reduction area contains the personnel and equipment decontamination stations and will be located at a recommended distance of approximately 40 meters upwind of the exclusion area. Level of protection for decontamination personnel may include Levels C and B.

The exclusion area will contain the worksite and designated hazard areas. Levels of personnel protection in this area will vary depending on work function, daily on-site activity, and monitoring data, etc.

Decontamination Procedures

A designated area will be established for personnel decontamination and equipment decontamination. Personnel and equipment decons should be separated by no less than 10 feet. The personnel decontamination area will contain at a minimum:

- o Decontamination solutions for glove, boot, and clothing;
- o Wash and rinse water;
- o Wash tubs and brushes;
- o Hand/face wash;
- o Disposable and equipment drop; and
- o Emergency first aid equipment.

All workers will be shown the correct procedures for decontamination and for changing from contaminated clothing to clean clothing. The decontamination areas will be monitored using a photoionization detector (PID) or flame ionization detector (FID) on a periodic basis to insure that this area does not become overly contaminated.

The recommended list of equipment and sample decon is minimally as follows:

- o Steam cleaner (optional);
- o Solvents (APR's must be worn during solvent decon);
- o Wash solutions and water rinse (DI or organic free water is recommended);
- o Collection tubs/basins; and
- o Plastic sheeting.

*EMERGENCY TELEPHONE NUMBERS ARE TO BE VERIFIED PRIOR TO SITE ACTIVITIES

E. EMERGENCY INFORMATION*

Local Resources

(To be determined prior to on-site activity)

Ambulance Zionville (317) 873-3363

Hospital Emergency Room St. Vincents Hospital, 2001 W. 86th St. (317) 871-2121

Poison Control Center Methodist Hosp. of Indiana, 1604 N. Capitol St. Indianapolis
1-800-382-9093

Police Zionville (317) 873-2233

Fire Department Zionville (317) 873-3344

Airport Boone County Airport, 1600 E. 250th St., South Lebanon (317) 873-4523

Explosives Unit

EPA Contact

Site Resources

Water Supply To be brought to the site

Telephone

Radio

Other

Emergency Contacts

1. Mr. Raymond Harbison (University of Arkansas) ..... (501) 661-5766 or 661-5767
   (501) 370-8263 (24 hour)
2. Ecology and Environment, Inc., Safety Coordinator/
   D. Dahlstrom ..... (716) 632-4491 (office)
   (716) 741-2384 (home)
3. Zone Project Management Office (CH2M Hill) ..... (703) 620-5200 (office)
4. Regional Project Team Leader/Manager
5. Regional Project Team Office
6. Ecology and Environment, Inc., AZPMO ..... (703) 522-6065
7. Regional Health Maintenance Program Contact
8. Ecology and Environment, Inc., 24-hour Emergency No. ..... (716) 631-9530

*EMERGENCY ROUTES ARE TO BE DRIVEN BY CH2M HILL PERSONNEL PRIOR TO SITE ACTIVITIES

F. EMERGENCY ROUTES*

(Give road or other directions; attach map)

Hospital: Exit site and turn left onto Rt. 421 South. Continue south to W. 86 Street (2nd traffic light past I-465) turn left, hospital is on right 1 mile.

Other: This site safety plan was developed based upon the most recent and available information provided by CH2M Hill personnel. It is recognized that site conditions may have changed, therefore, it is imperative that the personnel protective measures be thoroughly assessed by the project team leader prior to and during the planned activities. This site safety plan was designed to cover that stated under objectives. Any other activities on or off-site will invalidate this safety plan and will require further approval by D. Dahlstrom prior to initiation.

G. GENERAL ASSUMPTIONS

1. This Site Safety Plan is based on research and investigatory data which may be dated or incomplete. Site conditions may have changed. Consequently, the Site Safety Coordinator is cautioned to bring any unusual or changed site conditions which are inconsistent with the Safety Plan or which raise health and safety issues that require additional input or support to the attention of Ecology and Environment, Inc. (E & E), Attn.: Dave Dahlstrom, (716) 632-4491 or CH2M Hill, Attn.: Mary Anne Chillingworth, as appropriate.

2. The safety recommendations made in this plan assume (a) that all personnel on site have been determined by their employers and/or an authorized physician, to be in good mental and physical health, and able to perform anticipated tasks and react to emergency situations in a safe and appropriate manner; (b) that the company employing personnel subject to this safety plan has had its medical health and safety program approved by CH2M Hill and said program is designed to protect all employees who regularly work on hazardous material/waste projects; (c) that all personnel engaged in field activities subject to this safety plan have undergone training to an "intermediate level" or better, in an EPA-approved training program, in accordance with "EPA Guidelines for Hazardous Waste Investigations," Section 1440.2, and have appropriate experience in performing services in hazardous waste sites having both known and unknown waste characteristics; and (d) that any persons engaged in field activities subject to this safety plan are adequately trained in the testing and operation of recommended safety equipment.

3. Should the work objective or scope of work for a particular field assignment specified in this safety plan be changed at any time prior to the completion of the specified field assignment, the terms of this plan must be reviewed and re-evaluated because of the possibility that the plan may be inappropriate for the changed circumstances. In the event such changes in scope or work objectives occur, it is understood that the site safety officer and the project manager have the responsibility to re-evaluate the appropriateness of the safety plan in light of the changes and request a new site safety plan. It is further understood that the initial site safety plan is not designed for activities that are inconsistent with the scope of work or work objectives of this plan and that any activities undertaken by a subcontractor to CH2M Hill under such circumstances without modifying the health and safety plan is performed at the sole risk of the subcontractor.

H. ACKNOWLEDGEMENT AND CERTIFICATION FOR SUBCONTRACTORS TO CH2M HILL

_____, the duly authorized Site Safety Coordinator and repre-
(Print Name)
sentative of the subcontractor to CH2M Hill, _____
(Name of Company)
("Company"), hereby acknowledges and certifies on behalf of Company and its employees, agents, and representatives that he/she

(i) has reviewed the foregoing Site Safety Plan, understands its requirements;

(ii) understands and accepts the duties and responsibilities imposed on the company and its employees by paragraph G;

(iii) agrees that all of Company's activities on site will be performed in accordance with this Plan's requirements and the requirements of any other federal, state, or local law, statute, ordinance, rule, or regulation governing Company's activities on site.

(iv) agrees that it retains primary responsibility for the over sight and implementation of medical surveillance and health and safety protocols governing field activities, and any information heretofore provided by Ecology and Environment, Inc. and/or CH2M Hill regarding such matters, including the safety plan for a particular site, is provided for limited purposes and serves only as a supplement to the health and safety programs and information made available by said company to its employees; and

(v) in all cases where the company is authorized to conduct field activities without the supervision of E & E and/or CH2M Hill, it agrees that any and all on-site or other activities conducted by CH2M Hill and or Ecology and Environment, Inc., in no way absolve, relieve, release or discharge company, its officers, agents, employees, and representatives from its responsibility, obligation, and duty to comply with all requirements of this Safety Plan, or any other federal, state, or local law, statute, ordinance, rule, or regulation governing Company's activities on site.

_____
(Authorized Signature)

_____
(Date)

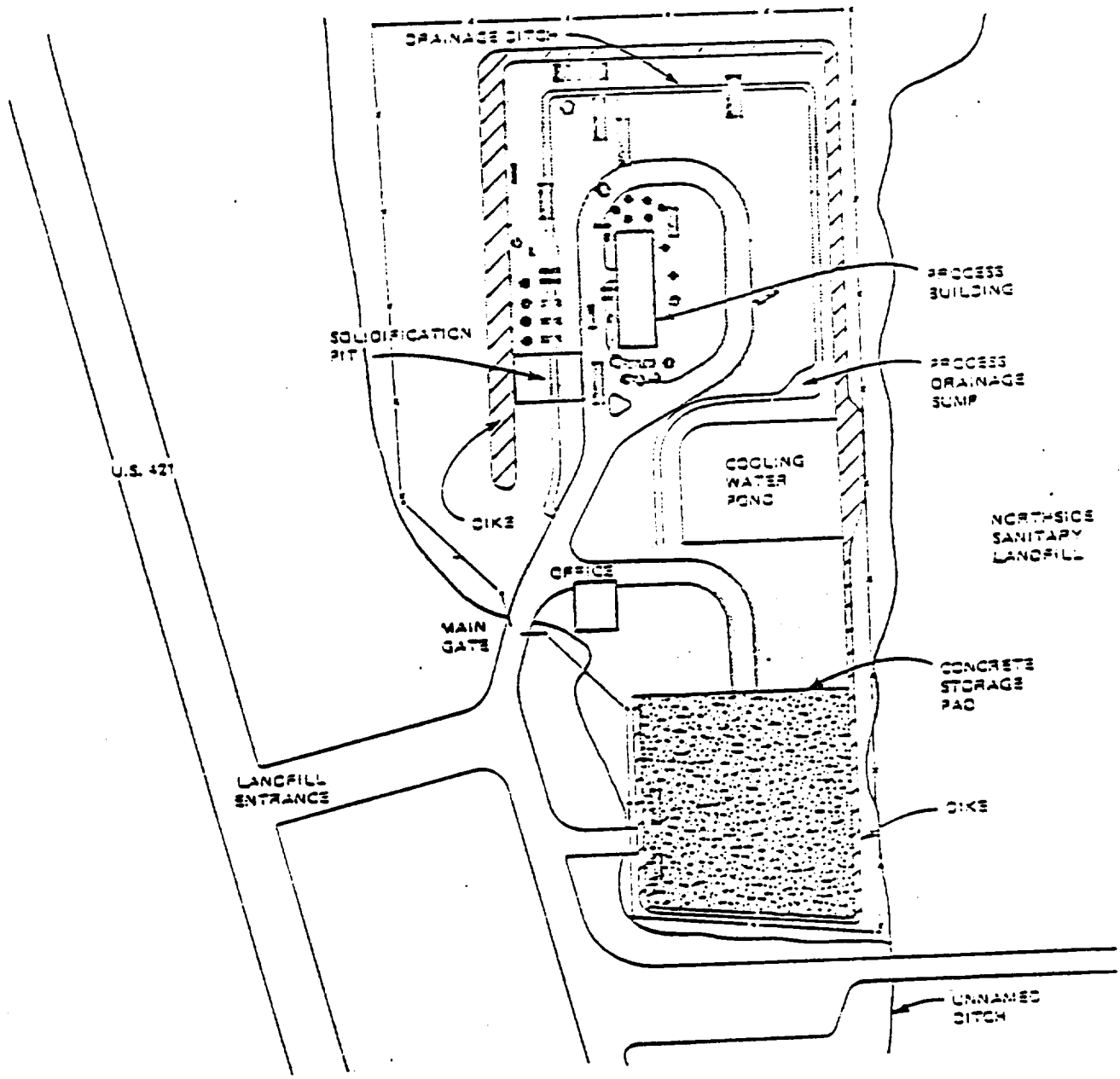

FIGURE 2-2
SITE MAP
SCC SITE

A0148862

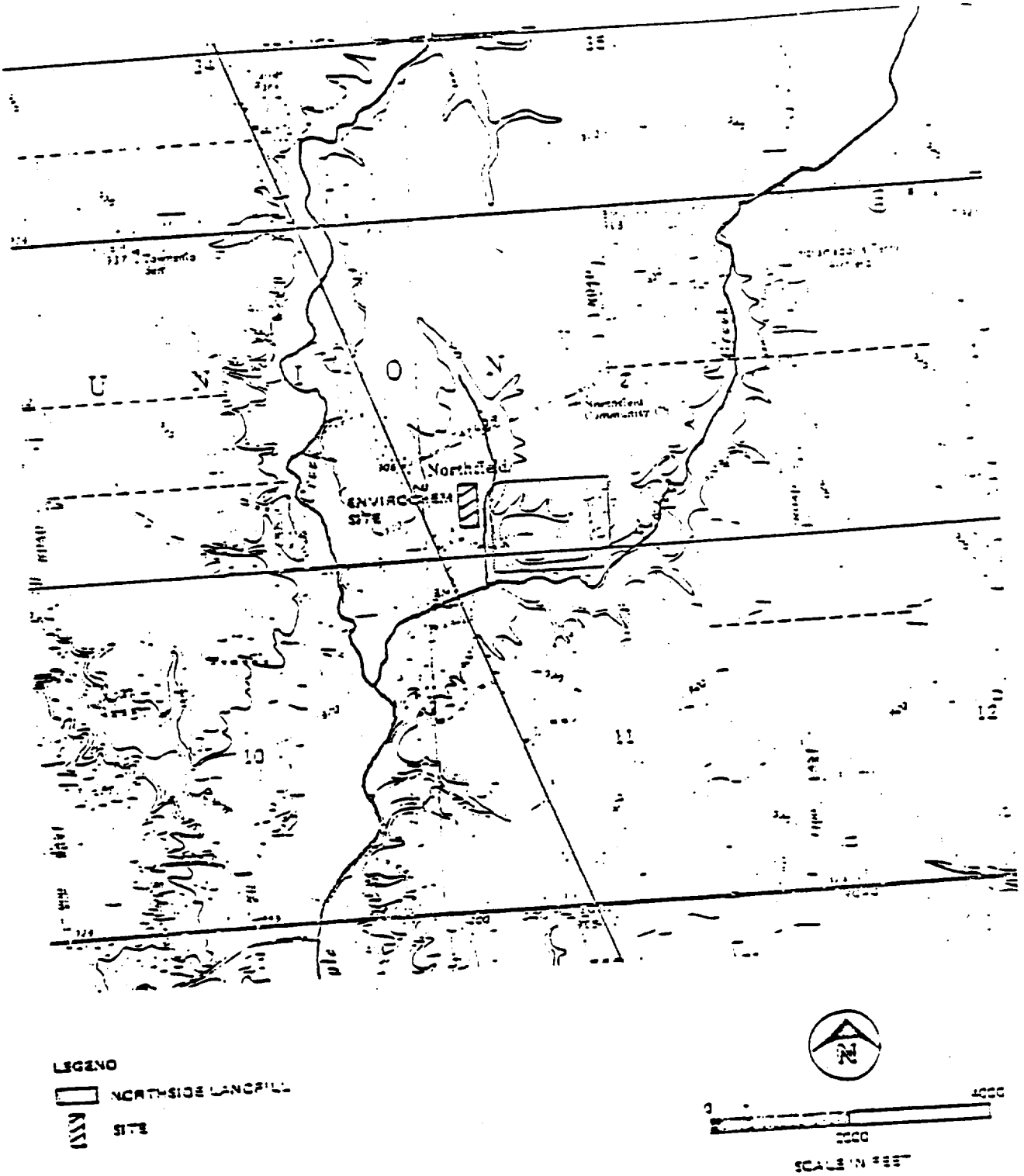

FIGURE 2-2
VICINITY MAP
ENVIROCHEM SITE

A014863

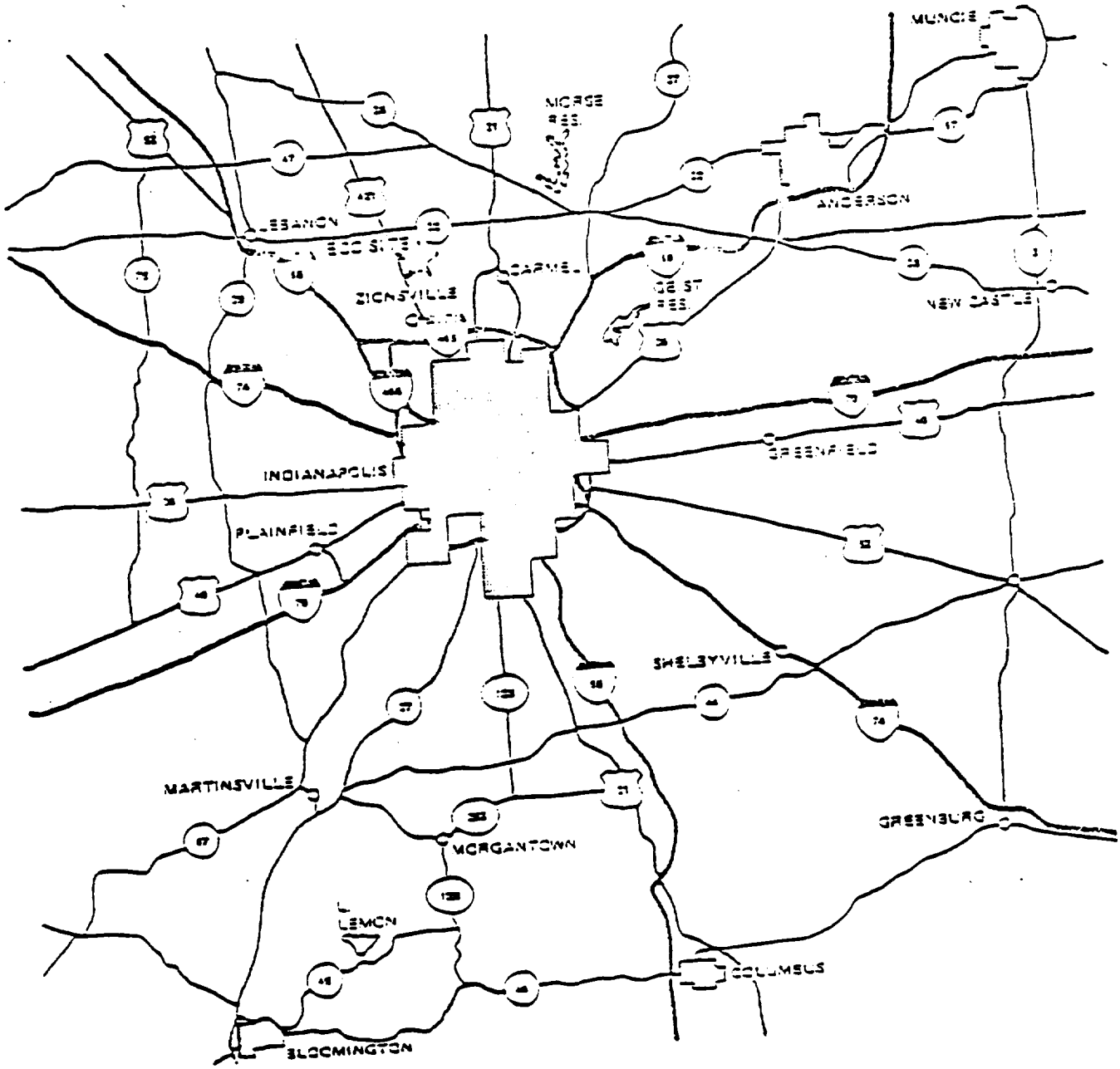

FIGURE 2-1
LOCATION MAP
SCC SITE

Section 6

SOIL SAMPLING TRIP INSTRUCTIONS

A. PERSONNEL

PERSONNEL	ASSIGNMENT
Pete Gorton - E&E	OVA operator
Russ Short - E&E	Site safety coor.
Dennis Totzke	Proj. mgr.; sampler
Ike Johnson	Sample team leader 1
Brad Berggren	Sample team leader 2
Randy Weltzin	Sampler, surveyor
Mark Lepkowski	Decon. tech, sampler, paperwork coor.

B. SITE DATA

Location:	Approximately 10 miles north of Indianapolis, Indiana, near Zionsville, Indiana.
Telephones:	EPA Trailer: 317-769-4482 Chem Waste Trailer: 317-769-4484
Site Conditions:	Much better!! All drums gone; all bulk liquids gone; all portable bulk tanks gone; contaminated lagoon water gone; so why are we going? Dirty dirt!! Background readings: 5-30 ppm (OVA)
Lodgings:	Individual rooms at Red Roof Inn (North) just off US 421 (317-872-3030) near Zionsville.

C. TENTATIVE SCHEDULE

Date	Time	Activity
5/6	3 p.m.	Leave Milwaukee; drive to Indianapolis. Dennis Totzke to pick up Brad Berggren and Mark Lepkowski; Isaac Johnson to pick up Randy Weltzin.

Date	Time	Activity
5/7	7 a.m.-noon	Arrive at site and set up decon. Calibrate instruments. Determine background conditions. Establish command post. Stake sample locations and check for buried drums and tanks. Obtain supplies. Get what we forgot.
	1 p.m.-7 p.m.	Begin sampling.
5/8	7 a.m.-noon	Sampling.
	1 p.m.-7 p.m.	Sampling.
5/9	7 a.m.-noon	Sampling.
	1 p.m.-7 p.m.	Sampling.
5/10	7 a.m.-noon	Sampling.
	1 p.m.-7 p.m.	Sampling.
5/11	7 a.m.-noon	Shut down, pack up and move out.
	noon-6 p.m.	Drive back to Milwaukee.

D. EQUIPMENT

OVA's - 2
OVA recorder - 1
HNU - 1
O_2/explosimeter - 1
Rad mini - 2
Dosimeter - 1 per person
SCBA (standby) - 1
Hand augers - 4
Auger extensions - 2
Walkie talkies - 3
Surveying equipment - 1 set
Decon. equipment - 1 hot line setup
Decon. equipment - 1 borehole setup
Plastic pails - 10
Tyveks - 100
Respirator cartridges - 160
Booties - 100 pair
Gloves, rubber - 6 pair
Gloves, surgeon - 100 pair

E. OBJECTIVES

- To use borehole monitoring and OVA survey analysis techniques to define gross total volatile organic contamination boundaries on the site (see sampling study plan)

- To delineate horizontal and vertical limits of contaminated soils so that the cleanup contractor can remove 4300 yds^3 of material
- To determine the approximate depth of contamination in the polymer pit
- To determine approximate depth and degree of contamination of cooling water pond sediments
- To accomplish the work safely and expeditiously (i.e., we don't have a lot of time or an expandable budget)
- To send about 35 soil/sediment samples to the CLP for analysis (samples will be sent after we return from the sampling trip)

GLT90/45